

THE  
BANKER'S MAGAZINE,  
AND  
Statistical Register.

---

VOL. VIII. THIRD SERIES. MAY, 1874.

---

No. 11.

## COINS, COINAGE AND BULLION.

## I. PREVENTION OF A FRAUD UPON OUR GOLD COINS.

BY WILLIAM E. DUBOIS.

*From the American Journal of Numismatics, January, 1874.*

The Hon. H. R. LINDERMAN, Director of the Mint, has just presented an admirable report on the condition and work of the institution under his charge. It will attract attention from numismatists throughout our country, and is a valuable contribution to our knowledge on the subject of the coinage. Dr. LINDERMAN requested the assayer, Mr. WILLIAM E. DUBOIS, to supply him with information as to certain experiments made at the Mint, several years ago, having for their object the better protection of the gold coin, by making them thinner and concave. In response to that request, Mr. DuBois submitted the following paper:

United States Mint at Philadelphia,  
Assayer's Office, Oct. 15, 1873.

I take pleasure in responding to the inquiry contained in a letter from the Director, on the steps that were taken here, some years ago, toward a prevention of the fraud of "filling" our gold coins.

These examinations and experiments were made September to November, 1860, thirteen years ago. I may state that it mainly fell to my lot to conduct them, but I had the indispensable counsel and co-operation of Mr. ECKFELDT, the late assayer, and Mr. LONGACRE, the late engraver.

They were brought about by the startling discovery, at the Treasury of the UNITED STATES in New York, of our gold eagles (ten-dollar pieces) having their interior taken out and replaced with a disk of platinum, a heavy and high-priced metal, of about one-third the value of standard gold.

This was neatly covered in by a soldered rim of gold, the whole presenting a genuine surface, and without fault as to weight, diameter, thickness, or sonority. Along with these pieces we had the benefit of experiments by Dr. TORREY, the late assayer of the United States Assay Office, at New York, so far as determining the composition of the pieces, and afterward we conferred with him personally as to the best means of prevention and detection.

Before stating our results and conclusions at that time, allow me here to insert that, just now, I am engaged in the examination of other filled pieces of larger and smaller denominations, lately sent to me by the able and vigilant chief of the Coin Department in the United States Treasury, at New York, GEORGE ASHLEY, Esq., along with other pieces of fraudulent make, but of a different sort. This was the first time that I was aware that the platinum filling had been practised upon any other size than the eagle, although we had found silver fillings in the half-eagle and quarter-eagle many years ago.

The platinum-filled pieces now on hand are the double-eagle, the eagle, and the half-eagle. The first-named was detected at the BANK OF ENGLAND, and thence sent over. Another double-eagle comes from the New York Treasury, and was detected there. Mr. ASHLEY remarks, "This is the worst fraud we have to contend with."

It seems this trouble is not confined to our coins. Some of the British sovereigns, it is stated, have been filled in the same way. That the large, thick double-eagles should be thus tampered with is not surprising, but we are compelled to wonder at their operating on half-eagles and sovereigns.

Now, without spreading abroad the way in which this thing is done (for that would serve no good purpose), let us look at the make-up of one of these filled coins. What with the two genuine outsides, the false inside, the new ribbed rim, and the solder, there are present no less than four separate pieces and five distinct metals, all put together with such nicety that none but an expert can tell the bad coin from the true.

Not to alarm the Government or the public, we have good evidence, so far, that the fraud is not much practised, and does not ordinarily go long undetected.

First, it is a slow way of making money, even for a consummate workman, and no second-rate man can do it; and, secondly, most of our coins soon find their way to the government treasuries, and there they have experts who can throw these pieces out at a glance or a touch, without being fully aware of the reason why. This remarkable faculty, possessed by Mr. TANDY, of the New York Treasury, more than by any other man we know of, reminds me of what was said of a money changer in ancient Rome, that "he could see brass through silver." And it is some comfort to know that this over-laying art is not a new

thing. Even the barbarous Germans, among whom the Roman denarii were current, were so suspicious of it that they made notches all around the coin to see what was inside; and some of these pieces, looking much like a circular saw on a small scale, have been handed down to our day and may be seen in rare collections. The Roman or Greek counterfeiter, however, was not to be named, in point of skill, with the rascals of modern times.

I should also mention that, with all the vigilance of Mr. ASHLEY and Mr. TANDY in New York, of similar officers in Philadelphia and elsewhere, so few of these altered pieces have yet appeared as to justify us in concluding, as above remarked, that the fraud is not extensively practised. Still it is very mischievous and injurious, and every means should be used to protect the treasury and the community from these losses of several dollars on a single piece of money.

Before proceeding to offer some suggestions in regard to the best mode of prevention, I would say a few words as to the best mode of detection. When, as already remarked, it is found that these filled pieces are right, or very nearly so, in weight, size, and sound, and have a genuine exterior, it must be apparent that our resources are very much cut down. There is usually, however, a slight discoloration, probably arising from heat during the soldering process. This cannot be much relied on, for a good piece may be discolored in the same way.

The test of specific gravity is one which they have not been able, and perhaps have not tried, to set at naught. Filling with plates of silver was abandoned by these artists, because that metal is not much more than half as heavy as gold, and so the reformed coin was either too light or else too thick. Platinum is a little heavier than gold, and although a scarce and dear metal, and hard to work, it was found to answer the purpose. However, this addition invariably makes the specific gravity of the coin too great, and that by a difference so considerable that the fact of filling can be assured without laying the piece open or impairing it in any way.

To come to figures: a genuine gold coin of the UNITED STATES (of any size, of course), will show the specific gravity about 17.20; or, if somewhat paled with silver alloy, as they were many years ago, perhaps as high as 17.30; that is to say, by way of explanation to those who have forgotten how specific gravity is found, between the weight of the coin in air and its weight in water there is a difference; which, as a divisor for the first weight, gives a dividend as above.

But we find that the double-eagle when filled shows a specific gravity 18.76, while the eagle and the half-eagle show specific gravity about 17.75 to 17.95. These differences are to be expected. We have no suggestions to make for the use of the criminals who are thus employed; they know very well that to

attempt to adjust the specific gravity, along with all the other points, would increase their work and render it unprofitable.

Still, this sure method calls for very good apparatus, some skill and practice, and a little time, say five minutes; more time than a teller can spare. So that, in a public office, it is extremely desirable to have such a man as Mr. TANDY, or our Mr. COBB. (No doubt a larger acquaintance would enable us to give other names, if needful.)

While I am on this point, allow me to repeat what was said in a former communication, that we find the difference of specific gravity quite as wide in the case of the new class of counterfeits, the five-dollar piece of 1872, regularly made and struck, but debased about six per cent. These pieces show specific gravity about 16.46; say, in round terms, 16.50. Thus, while the filled piece is too high, this is as much too low. It would be a very difficult matter indeed to elude this test.

Now, in regard to the *prevention* of the *fraud of filling*, only *two* modes seem to be worth considering.

First, the door to this business is at the rim or periphery of the coin; the place where the reeding stands as a sort of *chevaux-de-frise* to keep out intruders. It would be a good thing to strengthen the defences at this circumvallation; in plainer terms, to fashion the rim so that it cannot be tampered with or imitated without easy detection. Formerly we milled a legend, in sunken letters, on this part of our silver half-dollars.

In FRANCE and BELGIUM, and recently in SPAIN, the gold coins are protected in the same way, but with raised letters; while in the GERMAN EMPIRE, and some other countries, the thing is done as we used to do it.

Undoubtedly, it would be far more difficult to imitate or renew this lettering, whether raised or sunken, than the rib or reeding. They do that by making a new band, and going over it by the mechanical operation of a "nurling machine." Men of great skill *may* make the lettered edge, so as to be a fac simile, according to the truism, "What one man can do, another man may do;" but I am strongly of the opinion that it would take too much time and labor to pay well. At any rate it seems worth while to make the experiment.

The *other mode* to be considered, is to return to *thin* gold coins, and cease (or nearly cease) from issuing any of a larger denomination than ten dollars.

This may displease those who deal in large sums, and like to count by twenties. But if gold is ever to be a real currency it must be made to suit the man of one piece, no less than the man of a million. And with a cheap counting machine, such as we have in the Mint, the great objection will vanish.

I speak of it as a *return*. Formerly our gold coins were thin pieces; so were those of ENGLAND and the European continent

generally. The ducat, or sequin, a small, thin piece, was for ages the current coin of civilized and barbarous nations. The fourfold ducat of AUSTRIA is so thin as to be out of proportion to its broad diameter; yet it is a coin of great beauty and well struck up.

There is, it is true, a slightly and scientific proportion in the diameter and thicknesses of our gold coin since the remodeling in 1834, and especially in 1837. But this proportion has been twice set aside without offending good taste. The gold dollar had to be made thinner, to escape popular complaint; and the three-dollar piece had to be spread out to make it distinctive.

A very thin coin would be easily bent and abused; but that is an extreme not contemplated. The coin should only be thin enough to make it troublesome and unprofitable to be sawed through (on edge), to insert a plate. In fine, instead of attempting to get up an artistic impossibility, the writer would take advantage of an economic inexpediency, and there find the remedy.

A few words and figures as to dimensions. How thin should our gold coin be, and what should be the largest?

They should be made thinner at or about the centre, than they are at the edge. To a slight degree this is done already, but not enough; and this concavity should be double: that is, on both sides of the coin. Of course, it will be understood that this is to be produced by convexity of the dies.

It has long been the usage here to measure or regulate coins by twentieths of an inch for diameter, and by thousandths of an inch for thickness. Then it is proposed:

1. The ten-dollar piece, or eagle, to be of the diameter of 29 twentieths (1.45), which is one-twentieth less than the silver dollar, and two-twentieths more than the double-eagle; to be 35 thousandths thick at the edge, curving down to 25 toward the centre. At 25 we have the thickness of the old gold dollar.

No *wider* gold coin than this would be admissible, or desirable; but to comply with the law, and for special purposes, we might strike pieces of \$20, as they are now; the holders to run the risk of the evil we are fighting against.

2. Five-dollar piece, or half-eagle, diameter 21 twentieths (1.05), which is the same as the present eagle. Double concave, 30 thousandths at edge, 25 at centre.

3. Three-dollar piece, diameter 18 twentieths, at present 16; thickness, 25 thousandths, at present 34. This coin, and the lesser ones, need not be of the dishing-shape.

4. Quarter-eagle, diameter, 16; thickness, 25.

5. Gold dollar as at present.

It is further suggested, that this extension of diameter should not be in lieu of lettering on the edge, but that the latter should also be used, or tried, as far as thickness will admit.

It may be objected, that increase of surface exposes to increased abrasion. Numerous experiments here, not necessary to detail, prove that this is not the fact. It is also opposed to the philosophy of the case. As was stated by Mr. LONGACRE, formerly our engraver, a thin steel plate for bank-note engraving outlasts a thick one, from the fact that it has received a greater compression and condensation in preparing it. More than that, a compact, thick coin falls more heavily, and rubs more intensely, than an expanded, thin coin of the same weight. It is the far more frequent use of small coins which makes them wear more than large ones.

At the time we were experimenting, a five-dollar pattern was made, in copper, according to the shape proposed.

I am, very respectfully, your obedient servant,

WM. E. DuBois, *Assayer.*

P. S.—Since the foregoing was in print, I have been asked by Mr. ASHLEY, "Would the *concavity* of a coin injure its *sonority*? The latter quality is an almost indispensable consideration. I should prefer to resort to almost any other expedient, rather than impair this quality. It is the first test usually applied, when a piece is in doubt."

In view of this just remark, it gives me much satisfaction to add, that we made some planchets of standard gold, of different sizes, and of the *dish* shape; and found their sonority more marked than in pieces of the flat form. Indeed, the ring was beautiful, somewhat resembling that of a bell; and for the reason that this shape is slightly similar, although hardly observable.

---